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10/597,196	07/14/2006	Kunitaka Momota	101523.0001US1	7582

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EXAMINER
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NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
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1734

NOTIFICATION DATE	DELIVERY MODE
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04/15/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

rfish@fishiplaw.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/597,196	<b>Applicant(s)</b> MOMOTA ET AL.	
	<b>Examiner</b> Ngoc-Yen M. Nguyen	<b>Art Unit</b> 1734	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,7,9 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,7,9 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The drawings are objected to because in Figure 1, the stream coming out from tank "7" is labeled as "calcium fluoride slurry", it should be "calcium chloride slurry" instead. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 7, 9, 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 7, it is required that “the hydrochloric acid is produced by the reacting step *or* is supplied externally”; however, in the second “reacting” step (to produce an aqueous calcium chloride-containing liquid), only “the produced” hydrochloric acid is required to react to react with a calcium compound; thus, it is unclear if the hydrochloric acid was supplied externally, whether or not the second reacting step is positively required. Also, it is unclear what is required by “residual quantity of hydrochloric acid”.

In claim 3, it is required that the “fluoride-containing effluent” contains hydrochloric acid and it is unclear if the fluoride-containing effluent still has a pH 3 or higher even when it contains hydrochloric acid. It is assumed that when the fluoride-containing effluent has a low amount HF, such as “2.2% to 17.2%” HF as stated in claim 7, it would be considered as having pH 3 or higher, regardless of whether or not hydrochloric acid is present in the fluoride-containing effluent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-130,427 in view of Johansing, Jr. (5,705,140).

JP '427 discloses a process for producing high purity calcium fluoride from a mixed acid aqueous solution obtained in the decomposition of a fluorine compounds such as fluorocarbon. The mixed acid is distilled to remove metal impurities (note abstract).

JP '427 discloses that the mixed acid contains both HF and HCl (note paragraph [001]). After the distillation step, the mixed acid solution B still contains both HF and HCl (note paragraph [0020]). Calcium chloride is added to the mixed acid solution B to precipitate calcium fluoride (note paragraph [0021]).

The HF in JP '427 is considered as the "fluoride-containing effluent" as required in the instant claim 1. In JP '427, the fluoride-containing effluent (i.e. HF) is in combination with the HCl before adding the calcium chloride to form the calcium fluoride product, while the instant claim 1 requires that the fluoride-containing effluent and calcium chloride are separately added to the HCl in the reaction system. Since the calcium fluoride product cannot be formed until all three reactants, i.e. fluoride-containing effluent, HCl and calcium fluoride, are mixed, the difference between JP '427 and the instant claim 1 is the order of adding the reactants. Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated

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sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.)

The mixed acid solution B, obtained after distillation to remove metal impurities, contains 5% HF and 12% HCl (note paragraph [0020]). Since the mixed acid solution B has low amount of HF, it would have a pH 3 or higher as required in the instant claim 1.

Since the original mixed acid solution contains HCl and during the process, HCl is additionally formed (from the reaction between the calcium chloride with HF to form calcium fluoride and HCl, note equation in paragraph [0022]), just as required in the instant claims (note “under acidic condition with hydrochloric acid” and “the hydrochloric acid is produced by the reacting step” in claims 1 and 7), the pH of the process as disclosed in JP ‘427 would be low and it would have been obvious to one of ordinary skill in the art to optimize the pH of the process in order to effectively produce calcium fluoride from HF and calcium chloride.

Since the process of JP ‘427 has all the positive process steps as required in the claimed process, it would produce calcium fluoride particles having “a purity of 98% or higher”

For the reaction temperature, JP '427 does not disclose heating or cooling for the step of forming calcium fluoride by reacting the HF, HCl and the calcium fluoride, it is assumed that the reaction is carried out at room temperature.

In any event, for the reaction temperature and the particle size of the calcium fluoride product, it would have been obvious to one of ordinary skill in the art to optimize the temperature for the process to obtain the best results and it is known in the art to produce a precipitated product with large particle size so it can be easily separated from the remained solution.

The difference is JP '427 does not disclose the steps of producing calcium chloride from the HCl and recycling the calcium chloride to process of producing calcium fluoride.

Johansing '140 discloses a process for transformation of halogenated refrigerant gases (note title). The refrigerant gases react with oxygen and steam to form carbon dioxide and HF (note column 4, lines 11-33). Calcium chloride reacts with HF to form calcium fluoride and HCl (note reaction (d)). The HCl formed in reaction (d) is neutralized by the addition of purified calcium carbonate to form calcium chloride (note reaction (f)). HCl can also react with calcium hydroxide to form calcium chloride (note reaction (h)). The produced calcium chloride can be used in the formation of high purity calcium fluoride according to reaction (d) (note column 5, line 66 to column 6, line 3 and column 6, lines 15-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to react the HCl, by-produced by the reaction between calcium

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chloride and HF to form calcium fluoride, in the process of JP '427 with calcium carbonate or calcium hydroxide to form calcium chloride which can be recycled back to the process producing calcium fluoride, as suggested by Johansing '140 because by doing so the cost of fresh calcium chloride can be minimized and the need to dispose toxic HCl can be avoided.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '427, optionally further in view of JP '498 as applied to claims 1, 3, 7, 9 above, and further in view of Ohmi et al (5,362,461).

The difference not yet discussed is JP '427 does not disclose that the calcium fluoride can be used to produce HF.

Ohmi '461 discloses that it is well known in the art to produce HF by reacting calcium fluoride with sulfuric acid (note chemical reaction 1 in column 3).

It would have been obvious to one of ordinary skill in the art to use the calcium fluoride produced by the process of JP '427 as the reactant to produce HF as suggested by Ohmi '461 because using a product of one process as the reactant for the process is well the skill of the artisan.

Applicant's arguments filed February 3, 2011 have been fully considered but they are not persuasive.

Applicants state that a replacement drawing was submitted.



The drawing objection is maintained since no replacement drawing was attached to the response.

Applicants argue that the reaction product of JP '427 is a nanocolloid solution of  $\text{CaF}_2$ , which is contrary to the claimed size range of the instant claims.

In JP '427,  $\text{CaF}_2$  may have formed as "colloid" initially; however, "coagulation" would subsequently occur to form sediment (note paragraph [0012] and Figure 1, sediment "C" which is remained after removing liquid portion "D"). JP '427 fairly teaches the particle size of the  $\text{CaF}_2$  is larger enough to form "sediment" at the bottom of the tank. It would have been obvious to one skilled in the art to optimize the process condition of JP '427 to obtain  $\text{CaF}_2$  with suitable particle size so that it can easily be separated from the liquid phase.

Applicants argue that in the process of Johansing '140 reference, calcium chloride is produced in the removal of chlorine from the gases from reactions (h) and (j), which is clearly inconsistent with the reuse and recycle steps in the present claims.

In the process of Johansing '140, reaction (h) is considered the same as the second reacting step to produce an aqueous calcium chloride containing liquid as required in Applicants' claims 1 and 7 and the calcium chloride produced in reaction (h) can be purified (this step is not excluded by the "comprising" language in Applicants' claims) and reuse in reaction (d) to produce calcium fluoride, just as required in the "reusing" step of Applicants' claims 1 and 7.

Applicants argue that in Ohmi '461, the hydrogen fluoride is directly produced in a reaction process employing sulfuric acid.

In Applicants' claim 13, it is required that the calcium fluoride is used as "raw material" for producing hydrogen fluoride and as shown in Ohmi '461, calcium fluoride can be used to produce HF. The use of sulfuric acid as the other reactant as disclosed in Ohmi '461 is not excluded by Applicants' claim 13.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily Le can be reached on (571) 272-0903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M Nguyen/  
Primary Examiner, Art Unit 1734

nmn  
April 11, 2011